

## Claims

### What is claimed is

1. A method for processing overheads in an optical communication system, comprising:
  - in a signal receiving direction,
  - conducting an optical/electrical conversion, a serial/parallel conversion for the received optical signal, separating parallel overheads from the optical signal, extracting overheads necessary for overhead processing, conducting a parallel/serial conversion, generating and outputting a serial overhead frame; and
  - receiving the outputted serial overhead frame, conducting a serial/parallel conversion for the serial overheads in the received frame, inserting fixed reserved overheads, and reverting parallel overheads for overheads processing;
  - in a signal transmitting direction,
  - generating parallel overheads to be transmitted, extracting overheads necessary for overheads processing from the generated overheads, conducting a parallel/serial conversion, generating and outputting a serial overhead frame; and
  - receiving the serial overhead frame outputted, conducting a serial/parallel conversion for the serial overheads in the received frame, inserting fixed reserved overheads, reverting the parallel overheads, combining the overheads with payload data of the system, conducting a parallel/serial conversion, an electrical/optical conversion, generating and transmitting obtained optical signals. "
  
2. The method according to Claim 1, wherein the overheads necessary for overheads processing comprise: overheads carrying the information of management and maintenance.
  
3. The method according to Claim 2, wherein the information of management and maintenance comprises: voice channel information, user channel information, communication channel information, automatic protection switching information and information of reserved overheads defined by the system itself.

4. The method according to Claim 1, wherein the parallel/serial conversion comprises: inserting the extracted overheads necessary for overheads processing in a preset serial overhead frame.

5. The method according to Claim 4, wherein the serial overhead frame refers to a frame formed by multiplexing at least one 2Mb/s serial data bus with 32 time slots in a byte-interleaved multiplexing mode.

6. The method according to Claim 1, further comprising:

before outputting the serial overhead frame, checking the serial overheads, generating a check code, and inserting the check code in the overhead frame; and

after receiving the serial overhead frame, checking the serial overheads in the received serial overhead frame, comparing the check result with the check code in the serial overhead frame, if the result is correct, reverting the serial overheads to parallel overheads and implementing the subsequent processes; otherwise, sending an alert message.

7. The method according to Claim 1, further comprising:

before outputting the serial overhead frame, checking the serial overheads, generating a check code, and inserting the check code in the serial overhead frame; and

after receiving the serial overhead frame, checking the serial overheads in the received serial overhead frame, comparing the check result with the check code in the serial overhead frame, if the result is correct, reverting the serial overheads to parallel overheads and implementing the subsequent processes; otherwise, sending an alert message.

8. The method according to Claim 6, wherein the step of checking comprises: conducting an 8-bit bit-interleaved parity verification for the overheads.

9. The method according to Claim 7, wherein the step of checking comprises: conducting an 8-bit bit-interleaved parity verification for the overheads.

10. A device for processing system signals, comprising:

a signal processing unit, for receiving or transmitting optical signals, and implementing a separation or synthesis for payload data and overheads in the signals;

a payload data processing unit, for processing the separated payload data or generating the payload data for transmission; and

an overhead processing unit, for processing the separated overheads or generating the overheads for transmission;

a first pair of overhead transmitting interface conversion unit and overhead receiving interface conversion unit connected with both the signal processing unit and the overhead processing unit in parallel modes; wherein,

the first pair of overhead transmitting interface conversion unit and overhead receiving interface conversion unit comprises a first overhead transmitting interface conversion unit and a first overhead receiving interface conversion unit, and the output of the first overhead transmitting interface conversion unit connects to the input of the first overhead receiving interface conversion unit through a serial overhead bus; wherein,

the first overhead transmitting interface conversion unit is used for extracting overheads necessary for overhead processing from the inputted parallel overheads, conducting a parallel/serial conversion, generating serial overheads, and transmitting the serial overheads to the overhead receiving interface conversion unit; and

the first overhead receiving interface conversion unit is used for receiving the serial overheads from the overhead transmitting interface conversion unit, conducting a serial/parallel conversion, inserting fixed reserved overheads, reverting the overheads into parallel overheads and outputting the parallel overheads.

11. The device according to Claim 10, wherein the input of the first overhead transmitting interface conversion unit is connected to the output of the signal processing unit; and the output of the first overhead receiving interface conversion unit is connected to the input of the overhead processing unit.

12. The device according to Claim 10, wherein the input of the first overhead transmitting interface conversion unit is connected to the output of the overhead processing unit; and the output of the first overhead receiving interface conversion unit is connected to the input of the signal processing unit.

13. The device according to Claim 10, further comprising:

a second pair of overhead transmitting interface conversion unit and overhead receiving interface conversion unit connected with both the signal processing unit and overhead processing unit in parallel modes;

wherein the first pair of overhead transmitting interface conversion unit and overhead receiving interface conversion unit is connected to the bus between the output of the signal processing unit and the input of the overhead processing unit; and the second pair of overhead transmitting interface conversion unit and overhead receiving interface conversion unit is connected to the bus between the output of the overhead processing unit and the input of the signal processing unit.